12-14-2015 12:00 AM

The Use of Exercise Self-Talk by Female Adolescents

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A thesis submitted in partial fulfillment of the requirements for the degree in Master of Arts

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(Thesis format: Integrated Article)

by

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Masters of Arts

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Abstract

Already below recommended levels, physical activity participation in female youth is known to decline throughout adolescence. Self-talk, a form of self-regulation has been demonstrated to influence behaviour in both sport and exercise settings. The purpose of the present research was to explore the exercise related self-talk of teen girls (aged 14-18) with the intent of uncovering reoccurring themes and attributes in the self-talk of both low frequency exercisers (LFEs) and high frequency exercisers (HFEs). Participants were teen girls (N=28, M_{age}=15.56, SD_{age}=1.47) recruited from A. B. Lucas Secondary School in London, Ontario. Physical activity levels were measured using item 7 from the Physical Activity Questionnaire for Adolescents (PAQ-A). After participating in one of five group interviews, participants were grouped for data analysis based on their scores: LFEs indicated participating in exercise two times or less in the past seven days; while HFEs indicated participating in exercise three or more times in the past seven days. Group interviews were recorded, transcribed, divided into by participant into individual files and analyzed using a hierarchical classification system of codes and categories representing self-talk themes and attributes. Results indicated that teen girls' self-talk is complex and multidimensional, with varying trends in self-talk content, context, and characteristics in both HFE and LFE groups. Findings provide preliminary support for a potentially interactive relationship between self-talk and exercise behaviour. Limitations and recommendations for future research were noted.

Keywords: exercise, physical activity, female adolescents, teen girls, self-talk, exercise psychology

Acknowledgments

I would like to thank my supervisor Dr. Craig Hall for his ongoing guidance through this process and the teachers and students at A. B. Lucas Secondary School for their help and participation. As well, I would like to acknowledge my friends, family, and colleagues at the Exercise and Health Psychology Lab for their constant support.

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Introduction

Physical activity has become a prominent focus in today's society. Female youth demonstrate declining patterns of physical activity throughout adolescence (Yungblut, Schinkke, & McGannon, 2012). Teen girls thoughts on physical activity (PA) have been widely researched (Allender, Cowburn, & Foster, 2006; Clark, Spence, & Holt, 2011; Whitehead & Biddle, 2008; Yungblut et al., 2012), with a focus on uncovering perceived PA barriers and facilitators. Summarized by Yungblut and colleagues (2012), these barriers and facilitators relate to intrapersonal, social, and environmental factors. Intrapersonal factors include self-efficacy, perceived competence, and self-image. For example, teen girls are less inclined to participate in PA when they lack confidence in their ability to execute the skills demanded of the activity (Allender et al., 2006). On the other hand, when this confidence is present, interest in participation increases (Whitehead & Biddle, 2008). Social factors relate to the influence of peers, with the presence of friends facilitating participation in physical activity and the presence of judgmental others having the opposite effect (Yungblut et al., 2012). Lastly, environmental factors, such as gender relevant programming and the accessibility of facilities, have also been shown to influence physical activity participation in this demographic. The issue of inactivity in teen girls is multidimensional and complex. Previous research has provided a solid base of information regarding why or why not teen girls choose to participate in physical activity. However, this body of literature has yet to touch on the relationship between specific psychological processes and behaviour.

As described by Hall, Duncan, and McKay (2014), imagery (mental experiences created by one or more senses to mimic real life experiences) and self-talk (verbalizations addressed to the self), are examples of psychological processes shown to influence behaviour. In fact, research has demonstrated that both processes are skills that can be developed and implemented to achieve desired outcomes (Hall et al., 2014). As a form of self-regulation, self-talk can be used deliberately to alter one's own thoughts, behaviours, and responses (Morin, 1993), making it a thought process of particular interest when looking at behaviours like physical activity.

The majority of the self-talk literature relating to physical activity is in the sporting domain. To date, it has been demonstrated that self-talk is related to performance improvement (Hatzigeorgiadis, Zourbanos, Mpoumpaki, & Theodorakis, 2009; Theodorakis et al., 2004; Van Raalte et al., 1995), self-confidence (Hamilton, Scott, & MacDougall, 2007;

Hatzigeorgiadis et al., 2009; Hidayat & Budiman, 2014), self-efficacy (Zourbanos, Hatzigeorgiadis, Bardas, & Theodorakis, 2013), and learning achievement (Hidayat & Budiman, 2014). Early exploration of self-talk in exercise has provided insight into the use of self-talk by adults, with regular exercisers reporting the use of self-talk for various purposes including instruction, strategy, and motivation (Gammage, Hardy, & Hall, 2001). As well, active individuals have been shown to use positive self-talk to counter or balance negative thoughts regarding exercise (O'Brien Cousins, 2003). Specifically, adults within the first six months of being regularly active have reported using self-talk to motivate themselves to begin or continue exercising (O'Brien Cousins & Gillis, 2005). On the other hand, this same research uncovered that some adults use self-talk to talk themselves out of exercising. Although this research is a vital contribution to the area of exercise self-talk, many gaps still remain. The current body of self-talk literature regarding sport and exercise, which will be discussed in detail below, provides a starting point for the exploration of the use of exercise related self-talk by teenage girls. To our knowledge, the literature has yet to focus on this topic. As self-talk has been demonstrated to influence both cognition and behaviour, forming a detailed picture of how it is used by teenage girls may be assistive in addressing their physical inactivity.

Review of the Literature

Physical Activity

Physical activity (PA), a vital component of a healthy lifestyle, has been defined as energy expending body movement produced by skeletal muscle (Davidson, Passmore, Brook, & Truswell, 1979). Exercise is "planned, structured, and repetitive" PA with the objective of improving or maintaining physical fitness (Caspersen, Powell, & Christenson, 1985, p. 126). For the purpose of this study, PA and exercise will be used interchangeably to describe purposeful body movement requiring energy expenditure in leisure time, physical education classes, or organized fitness settings (such as fitness classes).

Research has demonstrated that a physically active lifestyle is associated with an array of health benefits. Particularly, youth who participate in PA have lower blood pressure, improved blood lipid profiles, increased self-esteem, increased academic success and enhanced wellbeing (Kristjansson et al., 2010; Robbins, Wu, Sikorskii, & Morely, 2008). In contrast, a lack of PA in adolescence has been show to contribute to poor health in adulthood, and is

considered to be the greatest predictor of obesity (Public Health Agency of Canada & Canadian Institute for Health Information, 2011). Additionally, insufficient PA is estimated to cause 21-25% of breast and colon cancers, 27% of diabetes, and 30% of ischemic heart disease (World Health Organization, 2009). The benefits PA (and detriments of inactivity) can be used to argue that in order to maintain health and vitality throughout life, participation in PA is a necessity.

Canadian youth are not meeting the recommended guidelines of 60 minutes of moderate to vigorous PA daily (World Health Organization, 2011). Illustrating a decline in PA throughout childhood and adolescence, only 14% of 5-12 year olds and 5% of 12-17 year olds are meeting the recommended levels (Active Healthy Kids Canada, 2011).

This marked progression away from participation in PA in youth (specifically in early adolescence) is supported by the literature (Allison et al., 2007; Biddle, Groely, & Stensel, 2004; Broderson, Steptoe, Boniface, & Wardle, 2007; Kimm et al., 2003; Pate, Dowda, O'Neill, & Ward, 2007; Pratt, Macera, & Blanton, 1999; Trost, Rosencrantz, & Dzewaltowski, 2008; Welsman & Armstrong, 1997), revealing an earlier and more drastic decline in PA levels in females, the already less active gender (Dumith, Gigante, Domingues, & Kohl, 2011; Whitehead & Biddle, 2008).

In order to uncover possible causes for this drastic decline in physical activity, researchers have looked into teen girls thoughts on exercise (Allender et al., 2006; Biddle, Whitehead, O'Donovan, & Nevill, 2005; Dambros, Dias Lopes, & Lopes dos Santos, 2011; Whitehead & Biddle, 2008; Yungblut et al., 2012). A large portion of this research has been dedicated to uncovering perceived barriers and facilitators of PA in this population. Specific examples of barriers to physical activity for teen girls include appearing masculine, drawing attention to an 'unfit' body, lack of confidence in ability to execute skills (Allender et al., 2006), not knowing anyone, the presence of judgmental peers (Yungblut et al., 2012), a lack of motivation, and competing priorities (Whitehead & Biddle, 2008). In terms of facilitators, teen girls acknowledge that benefits of PA include "feeling good" both physically and emotionally, fun/enjoyment, and experiencing the feeling of physical exertion (Yungblut et al., 2012). As well, increased participation has been associated with being accompanied by friends (Yungblut et al., 2012), activities that evoke feelings of competence (Whitehead & Biddle,

2008), a focus on participation over competition (Yungblut et al., 2012), and unstructured activities that promote creativity and self-expression (Clark, Spence, & Holt, 2011).

Whitehead and Biddle (2008) aimed to gain a more comprehensive picture of the reasons behind the behavioural choices of teen girls. Group interviews on physical activity participation and motivation were employed with 47 female students between the ages of 14 and 16 from a community college in the UK. Acknowledging the potential moderating effect of current activity level on thoughts towards PA, activity levels were measured by self-report and participants involved in a physical education course (n=13) were put in separate group interviews from those who were not (n=34). Inductive analysis resulted in the discovery of seven main themes; perceptions of femininity, self-presentational concerns, changing priorities, lack of motivation versus appreciation of the benefits, the desired structure of PA, parental support, and enjoyment. Consistent with the literature, the perception that femininity and PA are incompatible was more likely to be overcome by more active girls who showed a tendency to renegotiate these gender stereotypes (Azzarito, Solomon, & Harrison, 2006; Dwyer et al., 2006). In contrast, less active girls demonstrated a greater concern for participation in PA threatening their femininity. Specific concerns included ruined hair and makeup, sweating during and after the activity, and being perceived by others as masculine. Less active girls were also found to have greater self-presentational concerns regarding both appearance and ability. Specifically, they tended to compare themselves to others, perceiving their peers as 'skinner' or more beautiful than them. As well, less active girls frequently experienced heightened self-consciousness in physique salient clothing (i.e., gym uniforms, bathing suits), felt others were judging their competency while performing skills, and were often deterred from exercising due to embarrassment about their bodies (i.e., appearance, weight). In contrast, active girls were found to be less concerned about how others perceived their appearance or ability during exercise. Evidently, perceptions of PA differ based on current activity level. Thus, activity level should be considered when exploring the specific thought processes of teen girls relating to PA.

In summary, insufficient and declining activity levels in female youth are a cause for concern. It is vital for health and exercise specialists to develop methods to overcome possible aversions to physical activity participation. Adolescence is a critical point where future life habits are built. If this population continues to exercise less, there is concern for the prominence of physically inactive lifestyles in adulthood. If, however, physical activity habits are

developed at this stage there is a potential for carryover into adulthood (Tergerson & King, 2002).

As demonstrated above, teen girls' perceptions of exercise are complex and multidimensional. Uncovering how specific thought processes, like self-talk, relate to exercise participation has potential to aid educators, researchers, and healthcare professionals in facilitating increased exercise participation in this population.

Self-Talk

A commonly referenced definition of self-talk by Hackfort and Schwenkmezger (1993) describes self-talk as "dialogue [in which] the individual interprets feelings and perceptions, regulates and changes evaluations and convictions, and gives him/herself instructions and reinforcement" (p. 355). Pioneering the study of self-talk in the physical activity domain, James Hardy (2006) expanded the definition of self-talk to: verbalizations or statements addressed to the self that are multidimensional, somewhat dynamic, have interpretive elements regarding content, and serve at least two functions (instructional or motivational). This definition led to a comprehensive framework in which Hardy specified that self-talk is comprised of six dimensions (Hardy, 2006).

Dimensions of self-talk. The six dimensions of self talk include: a) valence (i.e. positive, negative, or neutral); b) overtness (i.e., out loud or in your head); c) degree of self-determination (i.e., assigned or unassigned); d) motivational interpretation (i.e., motivating or demotivating); e) function (i.e., motivational or instructional); and f) frequency (Hardy, 2006). These dimensions are discussed in further detail as they act as a starting point by providing a framework for the exploration of self-talk use in unstudied populations and situations.

Valence. Currently, the self-talk literature is predominately sport focused, with particular attention being paid to the dimensions of valence and function. Valence is used to describe self-talk as positive or negative. Positive self-talk is defined as all self-statements interpreted as praise, self-validation, and encouragement; whereas, negative self-talk includes self-statements that are interpreted as discouraging, critical, and harsh (Hardy, 2006).

Research has demonstrated that positive self-talk is associated with improved performance while negative self-talk fails to improve, or is detrimental to performance (Hardy, Roberts, & Hardy, 2009). In 1994, self-talk valence and the performance of competitive junior tennis players was investigated, revealing a lack of association between positive self-talk and

performance, and an inverse correlation between negative self-talk and performance. Researchers explained that the findings regarding positive self-talk could be explained by measurement error (Van Raalte, Cornelius, Brewer, & Hatten, 1994). Furthering self-talk valence and performance research, Van Raalte and colleagues (1995) compared the effects of positive and negative self-talk on performance in a dart-throwing task. The performance of the male undergraduate participants (N=45) was measured by distance of the dart from the bull's-eye. Participants were randomly assigned to one of three groups: positive self-talk (stated, "I can" before each throw); negative self-talk (stated, "I can't" before each throw); and a control (given no self-talk instructions). It was found that the positive self-talk group significantly out-performed the other two groups, negative self-talk and the control, which did not significantly differ from each other.

More recently, Hamilton and colleagues (2007) studied the effect of self-talk valence on performance for an endurance cycling task. The study had a single subject, multiple baseline design, using nine university aged participants who were familiar with cycling (none at a competitive level). All participants completed two 20 minute cycling sessions a week (spaced at least one day a part) with the goal of achieving maximum performance, measured as a product of revolutions per minute (rpm) over resistance. Participants were divided into one of three groups: self-regulated positive self-talk (provided with examples and encouraged to use positive self-talk), assisted positive self-talk (listened to an audio tape of positive self-talk examples and was encouraged to internalize statements during cycling task), or assisted negative self-talk (listened to audio tape of negative self-talk examples and was encouraged to internalize statements during cycling task). Participants in all groups were able to monitor their own rpm and resistance and were reminded every 2 minutes how much time was left. Results indicated improved endurance performance for both positive self-talk groups and two thirds of the participants in the negative self-talk group.

It can be concluded that positive self-talk has been consistently demonstrated to aid in sport performance. Negative self-talk may be detrimental to performance; however, further investigation is warranted as results are inconsistent. Although no known interventions have been employed to determine the effect of self-talk valence in an exercise setting, a qualitative analysis of the use of self-talk in exercise did, however, reveal that positive self-talk was used more frequently by regular exercisers than negative self-talk (Gammage et al., 2001).

Self-determination. Degree of self-determination refers to whether or not the statement is assigned (dictated by a researcher, trainer or coach) or freely chosen. Hardy (2006) noted that in naturalistic settings athletes self-talk is, most likely, freely chosen. The assumption that self-talk in exercise and physical activity settings is self-determined (freely chosen) was carried forward for the purpose of the present research.

Function. Self-talk can be used for two main functions; instruction and motivation. To date, the function of self-talk is one of the more thoroughly studied areas of the literature. Motivational self-talk is used with the intent to positively influence mood and increase confidence and effort; where, instructional self-talk is intended to improve execution focusing on strategy and technique (Theodorakis et al., 2000). Early research demonstrated that precision based tasks benefit more from instructional self-talk; whereas power-based tasks (i.e., strength and endurance) benefit more from motivational self-talk (Hatzigeorgiadis, Theodroakis, & Zourbanos, 2004). In 2011, a review of the literature revealed a lack of support for these differential effects (Tod, Hardy, & Oliver, 2011); however, there is evidence that both instructional and motivational self-talk are beneficial alone and when combined.

In 2009, Hatzigeorgiadis and colleagues found that knowledge and use of both instructional and motivational self-talk aided in increasing self-confidence, decreasing anxiety and improving task performance in youth tennis players. Further, Hidayat and Budiman (2014) examined the influence of motivational and instructional self-talk on badminton skill in beginner male and female youth badminton players, specifically for learning achievement and self-confidence. In this randomized controlled trial, participants were divided into one of three experimental groups (motivational self-talk, instructional self-talk, and a combination of the two) and one control group (no self-talk instructions). Results indicated a significant positive influence of self-talk when compared to the control group and that using both motivational and instructional self-talk had the most significant influence on learning achievement and self-confidence. In terms of the individual effects of the two functions, instructional self-talk significantly increased learning achievement and motivational self-talk significantly enhanced both learning achievement and self-confidence. These findings indicate that there is potential for both motivational and instructional self-talk to facilitate exercise behaviour by improving performance, increasing confidence, decreasing anxiety, and enhancing learning achievement.

Overtness. The dimension of overtness is described as whether or not self-statements are said out loud or quietly in one's head. There has been no research comparing overt and covert self-talk in sport or exercise settings to date.

Interpretation. Moderated by situation context and valence, self-talk is often interpreted as motivational or demotivational (Hardy, 2001). In the early stages of self-talk research, the intuitive assumption was that positive self-talk would be perceived as motivational, and negative self-talk as demotivational. This assumption has been supported to a degree; however, to some individuals negative self-talk is perceived as motivational, leading to the conclusion that personal interpretation, not necessarily valence, strongly influences the effect of self-talk (Tod et al., 2011). In this light, it was acknowledged that the inclusion of participants in the process of deciphering self-talk meaning may be beneficial (Tod et al., 2011).

Frequency. The dimension of frequency refers to how often self-talk is used. Research has shown that successful athletes may use more self-talk than unsuccessful athletes, and that it is used more often in sport when pressure and time spent practicing and competing increase (i.e., late competitive season compared to off season; Mahoney & Avener, 1977).

These six dimensions provide a framework for understanding the use of self-talk in physical activity settings. In fact, although published prior to the solidification of these dimensions, similar constructs are seen within the exercise self-talk literature.

Self-talk in exercise. Gammage and colleagues (2001) initiated the exploration of self-talk in exercise using qualitative methods to determine if and how exercisers use self-talk. Specifically, they explored the 4 W's of self-talk; where, when, what and why. Participants, recruited from a first year health science course, were male and female regular exercisers from a variety of exercise domains. Participants were given an explanation of self-talk, based on the previously mentioned self-statement definition by Hackfort and Schwenkmezger (1993), and asked to complete a questionnaire.

Participants reported using self-talk with a moderate frequency with the most common settings, respectively, being at the workout location and at home (the 'where' function). In regards to 'when', self-talk was used most frequently during exercise and then before exercise. The 'what' function was divided into characteristics (structure, nature, and person) and content. The structure of self-talk was described as single cue words (i.e., "*breathe"*), phrases (i.e., "*let's go"*), and full sentences (i.e., "*remember why you are doing this"*). Phrases were used most frequently followed distantly by cue words and sentences, which were used to about the

same extent. The nature of self-talk, similar to Hardy's valence dimension, was described as positive (i.e., encouragement), negative (i.e., self-critical), or neutral (all statements that were neither positive or negative). The majority of self-talk was found to be neutral followed by positive and then negative. A limitation of this classification, reiterating the importance of considering the dimensions of both valence and interpretation, was that participants might have interpreted their self-talk differently than how it was categorized by the researchers. Gammage and colleagues (2001) acknowledged this danger of researcher classification, emphasizing the importance of considering the reasons behind self-talk use, along with what is actually being said. Person referred to first or second person speech. It was found that second person was used more often than first. The content of self-talk covered various subjects; however, exercisers most frequently reported giving task instructions, and reminders of the amount of exercise remaining.

Lastly, the question of 'why' indicated that exercisers employed self-talk for motivational and cognitive (instructional) reasons, thus supporting Hardy's (2006) function dimension. These two functions were further divided: cognitive into skill specific and general strategy; and motivational into mastery, arousal and drive. Of these two functions, exercisers reported using motivational self-talk more frequently than cognitive self-talk. Increasing and maintaining drive, a sub-category of the motivational function (focusing on goals and goal directed behaviours) was employed the most frequently.

Approaching the exercise domain in a very similar fashion to previous research in sport, Gamamge and colleagues (2001) furthered our understanding of exercise related self-talk in regularly active adults. How less active individuals talk to themselves about exercise and if differences exist between those with varying activity levels still required examination.

In acknowledgement of the lack of research regarding the actual thoughts lay people have in regards to physical activity, O'Brien Cousins (2003) investigated the self-referent thinking and self-talk of older adults in regards to personal experience, health issues, and motivation for active lifestyles. This study was guided by the observation that, "through interpretive research a researcher can go beyond numbers and listen to the words people use to "talk themselves" into or out of motivational states related to health information" (O'Brien Cousins, 2003, p. 439). Through in depth interviews of male and female adults (N=41, ages 55-91), it was determined that barriers to physical activity and negativity were present in the thoughts of both active and inactive participants. In order to participate in physical activity, it

was observed that positive thoughts did not need to outweigh the negative, they were just needed in balance. In contrast to inactive individuals, active adults demonstrated confidence in their ability to overcome "life's distractions and cognitive obstacles" (p.445). As well, active individuals were able to express their specific motivators for physical activity through thoughts containing plans and clear goals (O'Brien Cousins, 2003). Those that were irregularly active tended to be caught between knowing they should be physically active and a lack of ability to begin or maintain a physically active lifestyle. Their lack of consistent physical activity was described as "drifting into inaction" due to the instability of their convictions and decisions regarding physical activity. Further, inactive adults lacked thoughts regarding specific triggers or motivators to participate in physical activity and often countered reasons to exercise with negative arguments. These individuals tended to be lacking in internal positive dialogue regarding previous mastery (successful) experiences (O'Brien Cousins, 2003).

To expand on these discoveries, in 2005 O'Brien Cousins and Gillis aimed to; determine the active living patterns and health issues of aging adults, identify if self-talk is a strategy used by active people to motivate themselves, and investigate the kind of things people are saying about their health and lifestyles that promote or undermine their physical activity participation. A telephone survey containing both open and close-ended questions was used to inquire about demographics, physical activity levels, thoughts related to exercise, and examples of self-talk. Regarding self-talk, participants were asked questions such as, "Do you ever notice that you use self-talk?" and "What were you saying or thinking to yourself at the time you were provoked to think about being more active?" Results indicated that 88% of participants reflected daily on the decisions they made regarding physical activity and both active and inactive individuals were aware that they used self-talk. O'Brien Cousins and Gillis stated that, this finding "raises the possibility that awareness of self-talk may not be particularly helpful to motivation for physical activity. While elite athletes may benefit from purposeful self-talk, everyday people may experience self-talk less effectively by letting it rule them rather unconsciously" (p. 327). Those who were inactive demonstrated feeling obligated to exercise, which the researchers took as indication that these individuals were aware of the benefits of exercise, but they chose not to. Adults who contemplated becoming physically active often demonstrated the use of self-talk to talk themselves out of exercising (O'Brien Cousins & Gillis, 2005).

O'Brien Cousins and Gillis (2005) also found that those who were within the first six months of taking action to exercise regularly demonstrated success when using self-talk to talk themselves into exercising; reminding themselves of the benefits and goals or encouraging themselves to *"keep it up"* or *"just get out there and do it"* (p. 328). In contrast, some individuals who were already highly active did not find self-talk helpful. Interestingly, these individuals avoided thinking about exercise so they wouldn't have the chance to talk themselves out of it.

To date, exercise self-talk research has demonstrated that both active and inactive individuals talk to themselves about exercise. Gammage and colleagues (2001) demonstrated that adult exercisers: use self-talk with moderate frequency; mainly during exercise; referring to task instructions and the amount of exercise remaining; with statements primarily being neutral, in second person; and most frequently for motivation (specifically, increasing and maintaining drive). When considering older adults of varying activity levels, O'Brien Cousins (2003) revealed that active individuals used positivity to balance negative thoughts, demonstrated confidence for overcoming obstacles, and expressed specific motivators, plans and goals for physical activity. Where, in contrast, inactive individuals were aware of the benefits of exercise but focused on negative thoughts regarding physical activity, countered reasons to exercise, lacked previous mastery experience, and were unable to express specific motivators and reasons to exercise.

In 2005, the observation made by O'Brien Cousins and Gillis that both active and inactive individuals were aware of self-talk, raised the question of whether or not awareness of self-talk was beneficial for motivation. Across activity levels further differences in self-talk use were noted, revealing that self-talk may be detrimental for those contemplating exercise, motivating for early exercisers, and avoided by highly active regular exercisers (O'Brien Cousins & Gillis, 2005). The identification of known trends and effects of self-talk in physical activity settings above, begs the question of why these trends exist and how self-talk is able to effect behaviour.

Mechanisms of self-talk. In attempt to uncover how self-talk works to effect behaviour, researchers have explored various social and psychological theories. Following, the mechanisms of self-talk, both proposed and demonstrated in the literature are summarized.

Self-efficacy. Social Cognitive Theory indicates that one of the main determinants for behaviour change and maintenance is self-efficacy; defined as the belief that someone has in

their own ability to carry out the necessary actions to achieve a specific goal (Bandura, 1986). Strong self-efficacy beliefs have been shown to facilitate perseverance and success in the face of adversity. Being context specific, self-efficacy varies "across realms of activity, under different levels of task demands within a given activity domain, and under different situational circumstances" (Bandura, 1997, p. 6). Bandura (1986) describes self-efficacy as stemming from four main sources; previous performance accomplishment, vicarious experience, verbal persuasion, and interpretation of physiological and affective states. Self-talk, a form of verbal persuasion, can have a powerful effect on self-efficacy (Hardy, 2006). Bandura posits that the influence of verbal persuasion on behaviour increases when coming from a source that is considered credible (Bandura, 1986). Indeed, research has found that individuals perceive self-generated statements about the benefits of exercise as more credible and more persuasive than arguments generated by others (Baldwin et al., 2013). As such, self-generated self-talk statements may be considered a credible source of verbal persuasion with the ability to strongly influence self-efficacy (Hall et al., 2014).

Early self-talk research did not examine self-efficacy directly; however, positive statements reinforcing self-efficacious beliefs were shown to have a positive influence on performance (Van Raalte et al., 1995). In 2013, Zourbanos and colleagues explored the influence of motivational self-talk on the self-efficacy and performance of male and female undergraduate students in a dart-throwing task. Motivational self-talk was found to significantly increase self-efficacy when compared to a control group; however, there was no difference between the groups for performance. These findings support the conviction that self-verbalizations have the power to contribute to increased self-efficacy for the completion of a task. Although it has yet to been explored, it is likely that self-talk has a positive effect on self-efficacy and performance in exercise settings.

Motivation. The Self-Determination Theory posits that motivation falls on a spectrum from extrinsically to intrinsically driven (Deci & Ryan, 1985). Research has demonstrated that individuals who engage in regular exercise are regulated more by intrinsic (autonomous) forms of motivation (Duncan, Hall, Wilson, & Jenny, 2010). Self-talk can be used to reinforce internal beliefs, increasing autonomous forms of motivation (Hall et al., 2014). Thus, self-talk has the potential to be used as a tool for facilitating adherence to exercise through influencing motivation.

Self-regulation. Achieving important goals, such as engaging in or adhering to exercise, requires a high degree of self-regulation (Cantor & Blanton, 1996), a deliberate effort by the self to alter behaviour, thoughts, impulses and other states or responses (Baumeister & Vohs 2007). Self-talk, thought to be a vital component of self-regulation, is instrumental in controlling and modifying thoughts, behaviours, and impulses (Morin, 1993).

Kross and colleagues (2014) looked at self-talk as a regulatory mechanism and the effects of language used on self-distancing, an effective self-regulation strategy that involves taking a step back and looking at personal experiences from the perspective of an observer (Kross & Ayduk, 2011), in social anxiety provoking situations. They were able to demonstrate, through a series of six studies, that non-first person pronouns enhanced self-distancing, improved regulation of stress in self-presentational situations, resulted in the use of less maladaptive post event processing, and led to a more positive appraisal of future stressors. As well, none of these effects were moderated by trait social anxiety. These results are important as they demonstrate the potential effect of self-talk and self-talk perspective on behaviour and thought.

Attentional focus. Attentional focus has been recognized as having two dimensions, width and direction. The width dimension refers to whether the focus of attention is broad or narrow, while the direction dimension regards attentional focus as internal or external (Nideffer, 1976). Self-talk, as mentioned above, is a form of self-regulation and can be used to direct and redirect attentional focus within the dimensions of width and direction (Hardy, 2006). For example, exercise is often accompanied by negative physiological states, such as sore muscles or labored breathing. Allowing these states to become the focal point of one's thoughts could be classified as a narrow-internal focus, and may have a detrimental effect on performance and enjoyment. Self-talk can be used to redirect attention externally (by repeating to do lists or making plans, for example) distracting the exerciser from sore muscles and tired lungs, and in turn potentially enhancing both performance and enjoyment (Hall et al., 2014).

Detrimental self-talk. O'Brien Cousins and Gills (2005) revealed that some regular exercisers try not to think about exercising in order to avoid talking themselves out of it; something those contemplating exercising do often. This shows that, although often noted for its facilitative effects, self-talk can also have a negative impact on behaviour. Above, self-efficacy, motivation, self-regulation, and attentional focus were discussed in terms of exercise facilitation. What if these same constructs were approached in an opposite manor? Based on previous findings, it is plausible that exercise behaviour would be hindered by self-talk that

reinforces inefficacious beliefs, counters motivational thoughts, rationalizes exercise avoidance, or focuses attention on debilitating sensations. The previously referenced study, by Van Raalte and colleagues (1995), had some participants use the phrase "I can" while others said "I can't" prior to throwing a dart at a target. Those in the "I can" group outperformed the "I can't" group; however, the "I can't" group did not differ from the control. "I can" is a self-efficacious statement, whereas; "I can't" is inefficacious, reinforcing the belief that one does not have the ability to successfully complete the task. Intuitively, it could be assumed that if efficacious statements improve performance, than inefficacious statements would hinder it, but this might not always be the case. In Van Raalte's experiment these statements were assigned, not self-determined, meaning that the statements may not have reflected the actual beliefs of the participants. As previously mentioned, internal beliefs are perceived as persuasive credible sources of information. Thus, the effect of inefficacious self-talk may be more significant when the statement is self-determined and the individual truly believes that they are incapable of achieving the given task.

Considering the potential of self-talk to influence exercise cognitions and behaviour, the current research aimed to expand on the literature by exploring how self-talk relates to both exercise behaviour and avoidance.

Research Overview

Already below the recommended physical activity levels, female youth continue to become less active throughout their adolescence (Yungblut et al., 2012). As inactivity negatively impacts multiple facets of wellbeing (Sallis, Prochaska, & Taylor, 2000; Shields & Bredemeier, 1995), the need to combat these trends is imperative. Although perceived barriers and facilitators have been unveiled within the literature, a paucity of research focuses on the specific thought processes of this demographic relating to physical activity.

Research on self-talk has predominantly explored the use and subsequent effects of self-talk in sport settings (Hardy, 2006; Hatizgeorgiadis et al., 2009; Van Raalte et al., 1995;) These findings, along with smaller contributions of research regarding exercise related self-talk (Gammage et al., 2001; O'Brien Cousins, 2003; O'Brien Cousins & Gillis, 2005), show that self-talk has the potential to contribute to improved performance, increased confidence, and increased self-efficacy in exercise. The literature has demonstrated that regular exercisers use self-talk frequently and strategically, during and before exercise for both motivational and instructional purposes (Gammage et al., 2001). However, as self-talk is moderated by various

factors, it can also be used in a way that impedes exercise behaviour (O'Brien Cousins & Gillis, 2005). To date, no known research has explored the use of exercise related self-talk by female adolescents.

The purpose of the present research was to explore the exercise related self-talk of teen girls (aged 14-18) with the intent of uncovering reoccurring themes and attributes in the self-talk of both low frequency exercisers (LFEs) and high frequency exercisers (HFEs). Due to the exploratory nature of this study and the paucity of research on exercise related self-talk, no specific hypotheses were advanced.

Methods

Participants

Twenty-eight female students, in grades 9-12, were recruited from A. B. Lucas Secondary School in the Thames Valley District School Board, London Ontario via contact teachers. Excluded from participating in group interviews were males, students outside of grades 9-12, and those who were unable to understand/communicate in fluent English. Assent and parental consent were obtained prior to the commencement of the group interviews. Five participants were excluded after data collection due to inconsistent and contradictory answers in both questionnaire and verbal responses. As well, these participants demonstrated a consistent inability to give their own examples; agreeing with or repeating the statements of others.

Measures

Measures included group interviews to allow for participants' to explain their self-talk freely and in depth and a questionnaire to assess exercise frequency (current activity levels).

Group interviews. Although carried out in the same manner as focus groups, this method of data collection was termed 'group interviews' as participants were regrouped using exercise frequency for data analysis. A total of five group interviews, consisting of 5-9 participants, a moderator and an interview assistant were conducted. Participants were divided into these groups based on similar age and activity levels to increase their comfort level. The moderator and interview assistant shared the same gender as the participants and were relatively close in age (Liamputtong, 2011). A flexible interview guide (Patton, 2002) was used allowing for inclusion or exclusion of topics as each session progressed. Due to participant age the group interviews were kept between 45 and 60 minutes and limited to 6 questions (Liamputtong, 2011).

Exercise frequency. In order to explore the self-talk of low frequency exercisers (LFEs) and high frequency exercisers (HFEs) separately, participants were grouped using the 7th item of the Physical Activity Questionnaire for Adolescents (PAQ-A; Kowalski, Crocker, & Kowalski, 1997). This item asked participants to choose a statement that best described how much physical activity they participated in during their free time in the last seven days. Scored from 1 to 5 the options were; *"All or most of my free time was spent doing things that involve little physical effort"*; *"I sometimes (1-2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics)"*; *"I often (3-4 times last week) did physical things in my free time"*; *"I quite often (5-6 times last week) did physical things in my free time"*; *"I very often (7 or more times last week) did physical things in my free time"*. This item was chosen as the most accurate representation of this population as it included both weekend and weekdays, and excluded mandatory activities such as physical education classes. Validation was achieved using a single exercise specific question; *"I participate in planned, structured, and repetitive physical activity for the purpose of improving or maintaining physical fitness."* Participants were asked to indicate how accurate this statement was for them on a 7 point Likert scale ranging from 1-7 (1=not true for me, 4=sometimes true for me, 7=very true for me). Spearman's rho indicated a moderate correlation between the two questions (r=0.53), which was considered sufficient to allow for the use of 7th item independently.

Procedure

For this exploratory study a mixed methods approach was used. Quantitative methods were employed to assess activity levels and group participants as low frequency exercisers (LFEs) and high frequency exercisers (HFEs). The main study was qualitative in nature, using group interviews to gain insight into how the participants used exercise related self-talk in both LFEs and HFEs groups and overall.

Data collection. Upon obtaining approval from ethics boards at Western University and Thames Valley District School Board (TVDSB), the researchers were directed by contacts at TVDSB to various school board members and teachers to request assistance with recruiting students. Contact was made with two teachers at A. B. Lucas Secondary School who recruited students individually from their classes. Students interested in participating were asked to classify themselves as exercisers or non-exercisers (for the purpose of organizing the group interviews) and were given the information letter/parental consent and assent forms.

The group interviews all took place at A. B. Lucas S. S. in classrooms selected based on availability. Classrooms were arranged so that the students were seated in a circle around desks in order to facilitate open communication and inclusion (Liamputtong, 2011). On arrival both consent and assent forms were collected and participants were welcomed and instructed to choose a seat and fill out a nametag. Participants were each given the PAQ-A and the exercise question to fill out "silently and honestly" while they waited for everyone to arrive. A moderator and assistant were present for each group interview. Once all participants were present and all forms were completed, the moderator initiated the group interview using the three-part flexible interview guide.

The first part of the guide, a welcome and introduction, explained the intentions and guidelines of the group interview, defined self-talk, and encourage participants to raise any questions or concerns at that time, or at any point in the future. The moderator and the research assistant introduced themselves and participants were asked to confirm that they were comfortable with the session being audio recorded. The moderator then explained that the assistant would be writing down the participants initials when they spoke next to corresponding time points in order to know who was speaking when referring to the audio recording later. The moderator then thanked the participants for their time, and asked that phones be turned off or put on silent for the length of the group interview. The participants were offered a juice box or water bottle and a granola bar and told that the conversation would last for approximately 45-60 min with a 5 min break halfway through. The meaning of confidentiality was reviewed and the participants were asked to confirm that they agreed not to share each other's names or anything that was said during the group interview. Participants were then invited to take turns sharing their name, grade, and a personal interest o,r hobby.

The second part of the guide consisted of the main discussion questions. Participants were asked to give general examples of their exercise related self-talk in order to ensure they understood the definition of self-talk. Examples of self-talk were provided until the participants were able to provide their own examples. Researchers were careful to note opposing self-talk types and examples equally (i.e., positive and negative, motivational and demotivational). The interview guide included questions regarding Hardy's (2006) self-talk dimensions (i.e., valence—*"give examples of negative or positive things you have said to yourself about exercise"*; i.e., interpretation—*"discuss how your self-talk motivates or demotivates you to exercise, give examples"*).

The third part of the guide consisted of the moderator summarizing the main points of the session and inviting participants to make final comments (i.e., "*is there anything you would like to add or ask before we finish?").* Participants were thanked for their time and invited to contact the researchers with questions at any time via email.

Data analysis. Using the audio recording and the assistant's notes, each of the discussions were transcribed by the moderator (the main researcher). Communicative gestures, and instances of agreement, consensus and disagreement were noted (Stewart & Shamdasani, 2014). Pauses, slang, and incomplete words were included and recorded as accurately as possible in attempt to represent the true meaning of the participants' statements (Stewart & Shamdasani, 2014). Individual files were created by dividing each of the transcripts by speaker, isolating all of the statements made by each participant. Separating out the statements of each individual allowed for the regrouping and analysis of responses based on exercise frequency (PAQ-A results). Files were then uploaded into the R package RQDA (Huang, 2014) for qualitative data analysis.

Inductive and deductive methods were applied in a cyclical manner to develop codes—words or short phrases used to represent or summarize themes and attributes found within the data—and corresponding categories to organize the data (Saldana, 2009). Early observations and themes, based on the dimensions of self-talk and other relevant literature, were used as initial codes—""first impression" phrases derived from an open ended process…" (Saldana, 2009, p. 4). As well, the interview guide prompted for examples of the dimensions of self-talk (i.e., valence and interpretation), which were used to accurately code other similar statements for each participant.

Initial codes were modified and descriptive codes, representing central topics, were created after several thorough readings and first cycle coding of the transcribed files. Codes were classified into a hierarchal category system based on the theoretical framework, reoccurring themes, and similarities between attributes.

Simultaneous coding allowed for each self-talk statement to be labeled with all relevant codes. After repeating first cycle coding methods several times, second cycle coding methods were applied and repeated resulting in the merging of codes and the finalization of categories to achieve thematic and theoretical organization (Saldana, 2009).

Transcripts included all of the statements made by each participant, resulting in a collection of self-talk quotes and explanations (dialogue outside of the specific examples). Only the self-

talk quotes were coded; however, explanations were instrumental in interpreting participants' self-talk.

In order to satisfy data trustworthiness (Lincoln & Guba, 1985) analyst triangulation—the reviewing of findings by multiple researchers—was employed (Patton, 2002). The main researcher and two external researchers initially coded one participant file individually. Researchers then met to discuss each coded sample in the file reaching an inter-rater reliability of 99%. As attitudes and topics of discussion appeared to vary between groups, the same process was applied to the file of a participant from another group. As an inter-rater reliability of 99% was again reached, the main researcher then coded the remaining 26 files. Final deliberation between the team members allowed for instances of uncertainty to be discussed and addressed.

With each file the number of codings (code applications) were counted for each code allowing for comparison of frequency counts to be analyzed overall and for HFEs and LFEs. The use of simultaneous coding allowed for the observation of paired codings; thus, researchers were able to look at the frequency counts of codes appearing together.

Results

Twenty-eight female high school students aged 14-18 ($M=15.56$, $SD=1.47$) participated in group interviews to discuss their use of exercise self-talk. Subsequent to this, participants were classified into one of two groups: HFEs ($n=13$) and LFEs ($n=15$). Age did not differ significantly between groups ($t(26)=0.38$, $p>0.5$, $MD=0.21$).

The grouping factor (HFE or LFE) was determined using the 7th item of the PAQ-A, which had possible scores ranging from 1-5. Results indicated that overall the girls participated in physical activity approximately two to three times on average in the previous seven days during leisure time ($M=2.76$, $SD=0.69$). The HFE group included all participants with a score of 3, 4 or 5 ($M=3.85$, $SD=0.90$), demonstrating three or more instances of PA participation during leisure time in the last seven days. The LFE group included those with a score of 1 or 2 ($M=1.67$, $SD=0.49$), indicating participation in PA during leisure time less than two times in the past seven days. See Appendix A, Table 1 for a summary of the demographic and grouping data.

Group interviews were transcribed verbatim and divided by participants into files. As simultaneous coding methods were applied each statement was associated with multiple codes.

The mean number of codes per participant (M=93.11, SD=50.26) did not differ significantly between HFEs and LFEs (t(26)=0.17), p>0.05, MD=3.16). See Appendix A, Tables 2-6 for a summary of the coding data.

Three higher order categories (context, content, and characteristics), encompassing more specific categories and sub-categories, were developed using both inductive and deductive methods.

Context

Described by timeand exercise behaviour, context accounted for the situation in which each self-talk statement was said (see Figure 1).

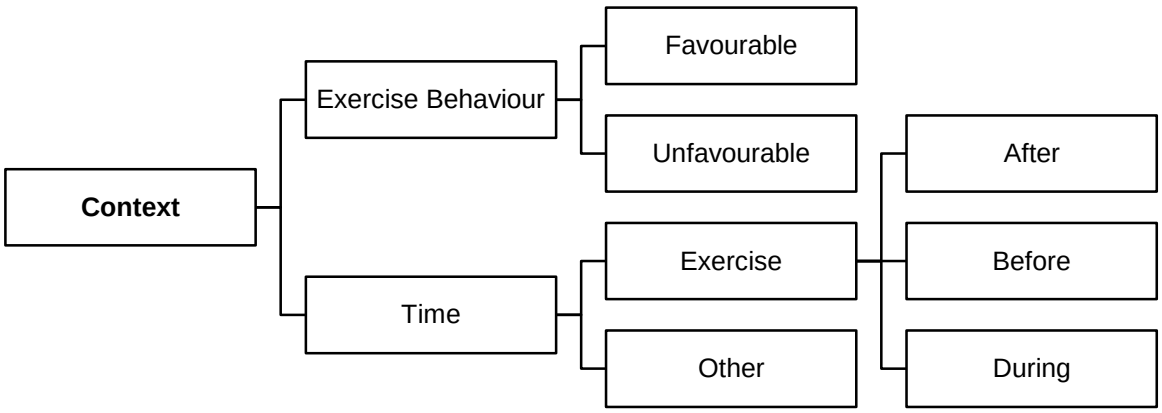

Figure 1. Context Sub-Categories and Codes

Time. Participants reported using exercise related self-talk both inside and outside of exercise settings. Instances outside of exercise (other) varied: some examples included hearing others discuss exercise, around meals, and instances that the participants felt their appearance was being evaluated (i.e., prom, shopping with friends, etc.). HFEs reported using self-talk most during exercise followed by outside of, and before exercise. LFEs used self-talk most outside of exercise settings followed by during and before exercise, respectively.

Exercise behaviour. Exercise behaviour associated with participants' self-talk was classified as either favourable (when participants started or continued to exercise at any intensity) or unfavourable (when participants stopped exercising or continued to not exercise). Statements were not coded for exercise behaviour if participation was mandatory (i.e., grade nine gym) or it was not possible to deduce how the participant behaved. HFEs' self-talk was

found to be associated with favourable more than unfavourable behaviour; while, LFEs' self-talk was associated more with unfavourable behaviour.

Content

As the most diverse category, content represented focal topics (focus) and participant attitude (see Figure 2).

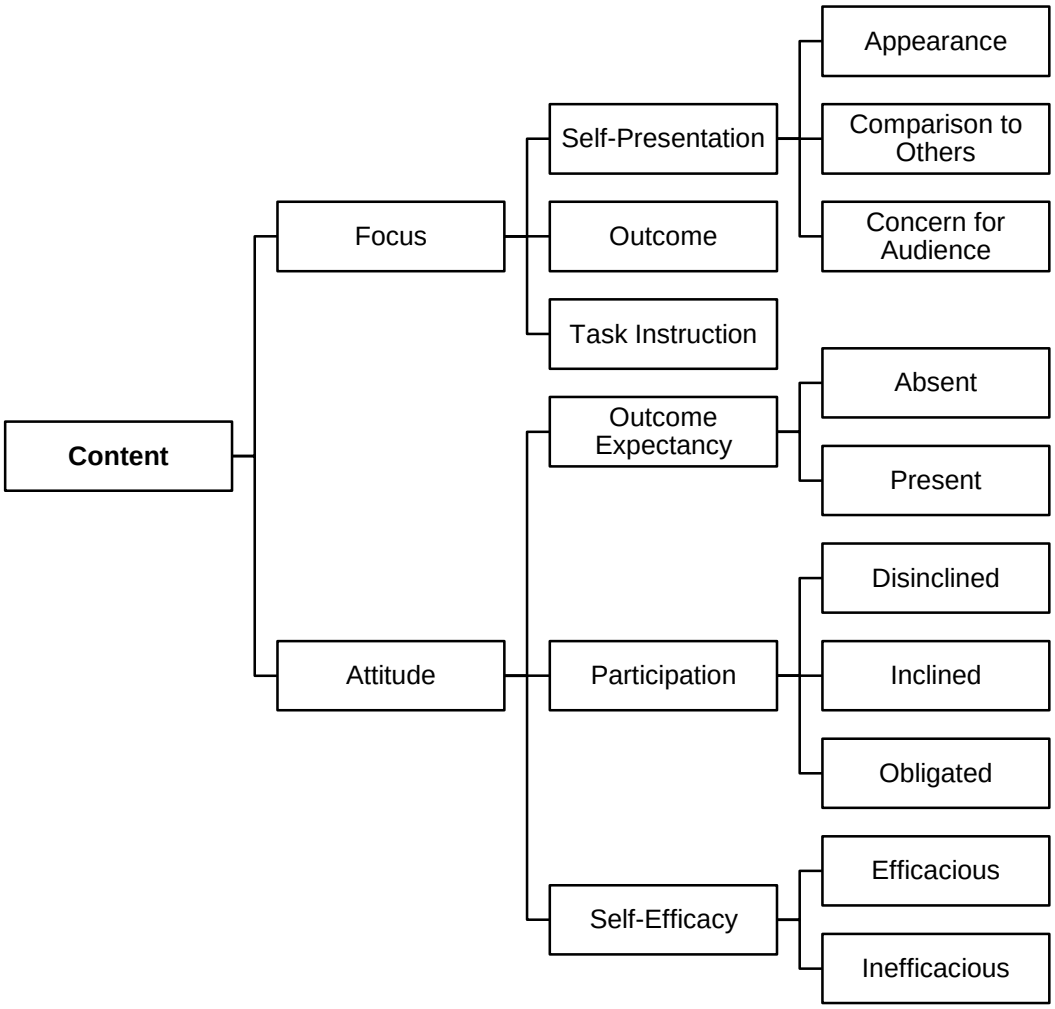

Figure 2. Content Sub-Categories and Codes
***See Table 6 for all content codes*

Focus. Participants' self-talk touched on various different topics; for the purpose of this study only the most prominent topics were discussed in detail.

Outcome. Participants in both groups often referred to the outcomes that they expected or desired from participating in exercise. By looking at the simultaneous presence of outcome and other focus codes, outcome was revealed to be associated most with appearance for both groups (see Appendix A, Table 5 for other outcome-focus code pairs). Brianna gave an

example of outcome focused self-talk when she recalled saying to herself, *"If I go workout I know I can burn those calories… just try hard, and then those calories can be gone and then I can do it again."* after eating a hamburger.

Self-Presentation. Leary (1992) described self-presentation as the effort put forth to control and maintain how others perceive us. Themes relating to self-presentation included; appearance, comparison to others, and concern for audience. Self-presentation was a prominent focus for both groups; however, LFEs focused on all three self-presentation topics more so than HFEs, with appearance, comparison to others and concern for audience being their three most common focuses after outcome. HFEs focused on self-presentation frequently as well, with the exception of concern for audience, which was focused on less frequently than other topics (i.e., task instruction).

Appearance. Participants' appearance related self-talk focused on how they looked physically or while executing a skill (i.e.,*"Man, I need to get fit so I look good in my dress"* or *"I don want to be running, it just looks really weird").*

Comparison to others. Comparison to others referred to instances where participants evaluated themselves in relation to others, saying things like, *"I work out every day and my tight clothing does not look like that. Why don't I look like that?"*

Concern for audience. Statements like, *"Everyone is looking at me, and this is why I should be working out because I'm not feeling comfortable in my body, but I don't want to work out because I feel like people are looking at me… so what do I do?"* demonstrated a concern for being observed by others.

Task instructions. Task instructions included statements that were used to give instruction such as, *"Try to play the catch up game instead of giving up"* or *"Just make it to the next tree."* Although intuitively statements including task instructions might be thought to be used for instructional purposes only, participants were found to use task instructions more frequently for motivation (i.e., to continue exercising). As their fourth most frequent focus, task instructions were used often by HFEs. LFEs did not frequently focus on task instructions in their self-talk when compared to other topics.

Attitude. Participants' feelings or position in regards to exercise as a construct were often indicated by their self-talk. Specifically, attitudes towards participating in exercise (participation), belief in personal ability to participate in exercise successfully (self-efficacy), and belief that exercising would lead to the desired outcome (outcome expectancy) were noted.

Participation. In both groups, participants were most frequently observed to feel disinclined, followed by obligated then inclined to participate in exercise. In comparison however, HFEs seem to show inclination and obligation more than LFEs who seemed to demonstrate disinclination more. Statements such as *"I don't want to do this, I'm not in the mood"* were taken to indicate that the participant felt disinclined to participate in exercise. Obligation was identified by terms such as *'should,' 'need to,' 'have to,' 'must,' 'force,'* and *'no choice',* and was associated almost equally with favourable and unfavourable behaviours. Erica described her thoughts about exercise after eating, saying, *"I need to burn off what I just ate."* Most participants mentioned that they didn't want to exercise, yet they felt that they should/had to. Statements like, *"Ya, I want to exercise… I feel it!"* represented inclination, the least frequently noted attitude towards participation.

Self-efficacy. Self-talk was described as efficacious when participants demonstrated that they believed they had sufficient ability, energy, skill, or time to successfully participate in, demonstrate, or complete an aspect of exercise. HFEs demonstrated efficacious beliefs the most while LFE demonstrated inefficacious beliefs most. Anna explained how setting small goals during her runs motivates her because she feels like she can achieve them: *"I got this" and "At least I can make it to the next land mark," and then I make it and I'm like, "Okay I did that, now I can go to the next one."* When these beliefs were lacking, self-talk was described as inefficacious**.** Nadia noted that she compares herself to others, which negatively impacts her belief in her own ability to exercise, *"Why aren't I as good as they are? Why can't I do what they are doing?"*

Outcome expectancy. Relating to participants' belief of whether or not exercise would result in the outcome that they desired, outcome expectancy was demonstrated as present or absent in the self-talk of some participants. Lydia demonstrated her belief that exercise would result in the outcome she wanted when she said, *"I could look like that if I just do what she's doing"* after seeing a girl she wanted to look like at the gym. On the other hand, participants like Katrina described doubt that exercising would produce the results they desired; *"Well nothing's happening, I might as well stop."* Outcome expectancy was absent slightly more than present for LFEs. For HFEs however, outcome expectancy was present much more (12x more) than it was absent.

Characteristics

Representing attributes of the statements themselves, characteristics included person, valence, and purpose subcategories.

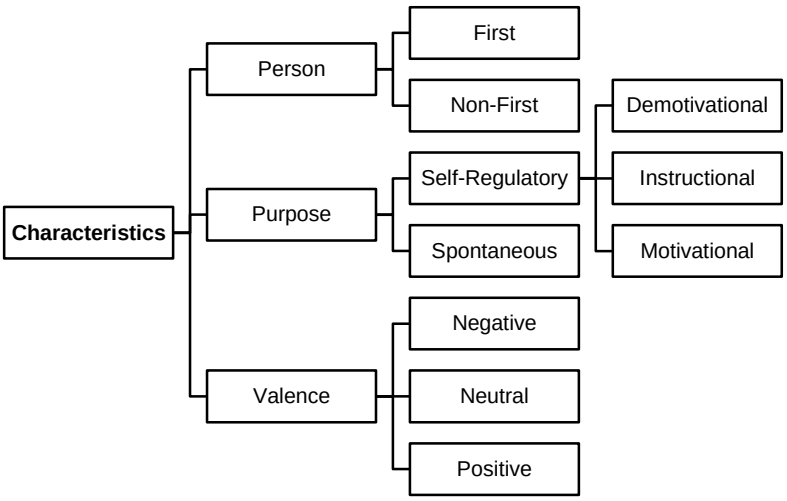

Figure 3. Characteristics Sub-Categories and Codes

Person. The perspective of each self-talk example was noted as first person or non-first person. Reported most frequently by both groups, first person statements used first person pronouns or were from the view of the participant (i.e.,*"I can do this"* or *"This is awful"*). Non-first person statements used the pronoun 'you', the participants own name, or were expressed as if being said by someone other than the exerciser (i.e., *"Come on! You can do it!"*).

Purpose. The category purpose was developed and modified from Hardy's function dimension (2006) to more accurately represent the present dataset. Originally the function dimension was divided into motivational and instructional self-talk; however, this would assume that self-talk was being used intentionally, which was not always true for the participants within this study. Participants either used self-talk intentionally, as a self-regulating mechanism, or spontaneously, with no obvious intention. As well, participants reported using self-talk to talk themselves out of exercising. Thus, self-talk purpose, discussed in order of frequency below, was described as self-regulating (motivational, instructional, or demotivational) or spontaneous. LFEs used spontaneous self-talk the most followed by motivational self-talk. HFEs used motivational the most followed by spontaneous self-talk.

Spontaneous. The most frequent overall, spontaneous self-talk was described as reactive or impulsive—lacking intent, effort, and premeditation. Sophie described how spontaneous negative statements like *"I can't do this! I don't want to do this. This is awful…"* kept cycling through her head while running on a difficult trail.

Self-Regulatory. Divided into motivational, demotivational, and instructional, self-regulatory statements were used with the intent to alter thoughts, actions, states, and responses.

Motivational. Participants' self-talk was classified as motivational when it was purposeful and facilitated exercise behaviour. As described by Gammage and colleagues in 2001, the motivation function is comprised of sub-categories: arousal, mastery, and drive. Arousal self-talk is used to get 'psyched up', relax, or avoid/deal with boredom. Mastery self-talk facilitates focus, coping, and self-confidence; which includes the focusing or refocusing of attention to cope with/get through a long or intense workout. Self-talk relating to drive can be used to control effort, increase or maintain drive, and provide encouragement and reminders of benefits and goals (Gammage et al., 2001). Although they were not noted individually, all three sub-categories were classified as motivational self-talk. Examples of motivational self-talk included; *"lets go", "you've done it before you can do it again",* and *"I can do this!"*

Demotivational. Self-talk used to rationalize, justify, and encourage exercise avoidance was classified as demotivational. Nadia, explained talking herself out of exercising by making excuses like, *"I don't have enough time"*, *"I just don't want to move"* and *"it's too hot out"*, or by focusing on concerns she had due to her lack of belief in her ability to perform exercises properly. She admitted that she says things like, *"I don't really want people to see me" because I know I'm not good at exercising.* Demotivational self-talk was the third most frequent self-talk purpose for both groups.

Instructional. Statements providing an order, command, or description of a process were classified as instructional. Although the present study did not distinguish between the two, instructional self-talk includes both general and specific instructions. General statements pertain to strategy, performance improvement, and workout programming, while specific statements regard skills or discrete actions such as posture, technique, and breathing (Gammage et al., 2001). An example of instructional self-talk was given by Maria, who used instructions like *"don't breathe loud"* and *"wipe away your sweat",* when trying to impress her workout partner. Instructional self-talk was very uncommon with only four examples provided by two LFE participants.

Valence. Each statement was classified as negative, positive, or neutral. LFEs used negative self-talk the most followed by positive then neutral, while HFEs used positive and negative self-talk almost equally, followed by neutral self-talk.

Negative. Self-talk quotes were classified as negative if interpreted as detrimental, critical, and harsh, or indicated helplessness, hopelessness, and frustration. Before exercising Holly admitted she often is negative, saying things like, *"Oh my gosh I don't want to go…I hope this ends fast."*

Neutral. Statements not appearing to be interpreted as either positive or negative by the participant were classified as neutral. Olivia discussed how she plans to exercise after school but then just does not, saying things like, *"Okay, I'm just going to have supper and go to bed."*

Positive. Statements coded as positive were considered self-validating, optimistic, hopeful, and encouraging. When feeling self-conscious before a trip Leah considered exercising more to look better in a bikini; instead, she reasoned that *"Maybe it doesn't really matter, not everyone has a perfect body."*

Discussion

The intent of this research was to explore teen girls' exercise self-talk in attempt to uncover common themes and attributes. Due to the moderating effect of activity level (exercise frequency) on thoughts towards exercise identified in the literature (i.e., Whitehead & Biddle, 2008), self-talk was analyzed overall and independently for both high frequency exercisers (HFEs) and low frequency exercisers (LFEs). Although both HFEs and LFEs used exercise related self-talk with equal frequency, trends in self-talk content, context, and characteristics were found to vary within the two groups.

Context

Time. Results indicated that HFEs used self-talk the most during exercise mirroring findings from Gammage and colleagues in 2001. LFEs however, used self-talk more outside of exercise settings. Based on previous findings that self-talk is often used by non/irregular exercisers to talk themselves out of exercising (O'Brien Cousins, 2003; O'Brien Cousins & Gillis, 2005), increased use of self-talk outside of exercise settings may be problematic. Previous research has mentioned that some regular (high frequency) exercisers have a 'just do it' mentality, purposefully avoiding self-talk so it cannot deter them from exercising (O'Brien

Cousins & Gillis, 2005). In this light, it may be useful for LFEs to attempt to 'just do it' as opposed to thinking about it.

Exercise behaviour. Results indicated that HFEs' self-talk was associated more with favourable exercise behaviour, while the self-talk of LFEs was more frequently linked to unfavourable behaviour. Future research should look to verifying the simultaneous presence of self-talk attributes and favourable or unfavourable behaviours in HFEs and LFEs. This would contribute to understanding how and what self-talk specifically encourages or discourages exercise participation.

Content

Self-talk content related to the topics (focus) and attitudes represented in the participants' self-talk examples. Patterns suggesting an association between self-talk content and exercise behaviour arose when the literature and content trends within groups were considered.

Focus. Participants' self-talk covered numerous topics with frequent reference to outcome, self-presentational concerns, and task instructions (for HFEs specifically).

Outcome. Both HFEs and LFEs most frequently focused on the outcomes they hoped to achieve in their self-talk. Their specific focus on appearance related outcomes suggests appearance as a primary motivator for their exercise participation. Previous research has also reported that regular exercisers employ self-talk to remind themselves of desired outcomes (Gammage et al., 2001).

Self-presentation. The prominence of self-presentation focused self-talk (appearance, concern for audience, and comparison to others) differs from previous exercise self-talk findings (Gammage et al., 2001); however, this focus is supported by research regarding teen girl's exercise related thoughts and barriers (Allender et al., 2006; Whitehead & Biddle, 2008; Yungblut et al., 2012). It appears that, unlike regular exercisers who focused on the process of exercising (i.e., task instruction, exercise remaining), teen girl's self-talk is focused more so on barriers and motivators like self-presentation. Leary (1992) explains that self-presentational concerns can be associated with either increased or decreased exercise behaviour. Schmitz and colleagues (2002) found placing a high value on appearance to be associated with increased physical activity participation in teen girls: explaining the prevalence of appearance related self-talk in HFEs. In contrast, supporting LFEs use of self-presentation focused self-talk, Culos-Reed, Brawley, Martin, and Leary (2002) found greater self-presentational concerns to

be present in those who exercised two times or less per week, when compared to those who exercise three or more times a week. Based on these findings (and recalling that LFEs were grouped due to their participation in physical activity less than three times a week), it is possible that the higher frequency of self-presentation focused self-talk reported by LFEs can be explained by their increased self-presentational concerns when compared to HFEs.

In the literature, the desire for appearance related outcomes has been found to correlate positively with external forms of regulation (introjected and external) and negatively with exercise participation (Ingeldew & Markland, 2008). In other words, constructs that are frequently depicted in the self-talk of participants in this study are known to predict insufficient or declining participation in exercise.

Future research should attempt to solidify the link between self-talk content and barriers/facilitators, and sources of motivation for exercise. Verifying this link would allow self-talk to be used as an avenue for gathering information on, and possibly manipulating, thoughts towards exercise. If confirmed, a possible way to decrease their inactivity would be to educate teen girls on how their thoughts (specifically self-talk) influence their ability to successfully maintain exercise habits.

It should be noted that although concern for maintaining femininity and appearing masculine were prominent barriers described in the literature (Whitehead & Biddle, 2008), the current study saw no mention of these topics. It is possible that either, these are not concerns for this particular group, or not all thoughts towards exercise were relevant to/verbalized as self-talk.

Task instructions. When exploring the content of regular exercisers' self-talk, Gammage and colleagues (2001) found task instructions and exercise remaining to be their main focuses. Based on the limited use of task instructions by LFEs and frequent use by HFEs (in both the current and previous studies), it seems that the use of task instructions is associated with favourable exercise behaviour. As previously mentioned, task instructions were often used for motivational purposes; HFEs may consider them to have a facilitate effect.

Attitude. The attitudes portrayed in participants' self-talk were related to participation, self-efficacy, and outcome expectancy.

Participation. In terms of attitude towards participating in exercise, in order of frequency, both groups reported feeling disinclined, obligated, and inclined. This reveals that these teen girls don't want to exercise, yet feel like they should. It is possible that these trends

could be explained by a heighted focus on barriers to exercise resulting in a lack of desire to participate.

Feelings of obligation were indicated by the self-talk of both HFEs and LFEs; however, these feelings seemed to be more prominent for participants in the HFE group. Feelings of obligation may stem from participants' sources of motivation (i.e., appearance outcomes). Markland and Ingledew (2007) revealed that appearance related motives are associated with statements like, "I must exercise", which are experienced as controlling and linked to decreased long-term adherence. Therefore, although these girls are currently exercising, controlling sources of motivation may impede their adherence to exercise over time (Ingledew & Markland, 2008; Markland & Ingledew, 2007).

Self-efficacy and outcome expectancy. Considering the body of literature, it could have been anticipated that HFEs would report using efficacious self-talk more than inefficacious self-talk with LFEs demonstrating the opposite trend. In 1983, Bandura and Cervone explained that efficacious beliefs facilitate behaviour maintenance by positively influencing persistence and effort; a premise which was supported in terms of exercise behaviour specifically by Desharnais, Bouillon, and Godin (1986). They found a strong positive correlation between self-efficacy and adherence to an exercise program. In this light, inefficacious beliefs are likely linked with a failure to adhere to/maintain exercise behaviour. Inefficacious self-talk was predominant in LFEs and, although they reported efficacious statements more frequently, HFEs also often demonstrated inefficacious beliefs. Considering their demographic has a tendency to deprioritize exercise as adolescence progresses (Whitehead & Biddle, 2008) and that inefficacious beliefs are linked with a lack of persistence and effort (Bandura & Cervone, 1983), it should not come as a surprise that these girls decrease their physical activity levels over time.

In terms of outcome expectancy, HFEs' self-talk demonstrated they believed exercise would result in the desired outcome, where the self-talk of LFEs demonstrated equal instances of belief and disbelief. Maddux (1982) demonstrated that outcome expectancy beliefs are correlated with behavioural intentions; in such, that a person's intention to carry out a behaviour increases with their belief that the behaviour will result in the outcome they desire. Building on these findings Desharnais and colleagues (1986) demonstrated that outcome expectancy positively correlates with not just intention, but exercise adherence as well. The more consistent presence of positive outcome expectancy in HFEs and opposing trends in self-

efficacy between the two groups may contribute to explaining their differences in exercise participation.

In the present study, self-efficacy and outcome expectancy were not specifically measured; however, since self-presentation was a prominent focus in the self-talk of participants, evidence linking these concepts is worth noting. In 2004, Gammage, Hall and Martin Ginis revealed higher levels of self-presentational efficacy (belief in one's ability to give a certain impression or perform a behaviour) and outcome value (the importance of the desired outcome; Leary, 1983; Maddux et al., 1988) in women who exercised three times a week or more when compared to women who exercised two times or less. These findings, along with the present study, suggest an interactive relationship between self-presentational concerns, self-efficacy, and exercise behaviour. Further understanding of these relationships is vital as it may allow for the use of self-talk to modify these beliefs and concerns (through avenues like cognitive behavioural therapy; Beck, 1967), which in turn may have a positive effect on exercise behaviour.

Characteristics

Including person, valence, and purpose, characteristics represented the attributes of the statements themselves.

Person. Contradicting findings by Gammage and colleagues (2001) who reported regular exercisers used second person self-talk most, in the present study the majority of self-talk was in first person for both groups. Interestingly, however, when considering self-talk perspective in terms of associated behaviour, the prevalence of non-first person self-talk increased when the associated exercise behaviour was favourable. Previously, non-first person self-talk has been associated with enhanced self-distancing, improved self-presentational stress regulation, decreased maladaptive post event processing, and increased positive appraisal of future stressors (Kross et al., 2014). In combination these findings provide preliminary support for the presence of an influential relationship between non-first/second person self-talk and favourable exercise behaviour; however, further investigation is warranted.

Purpose. Previous research has considered the functions of self-talk to be motivational or instructional. Although present in the current study, participants also reported use of spontaneous and demotivational self-talk. In fact, in terms of frequency counts, spontaneous self-talk was first overall and for LFEs and second to motivational self-talk for HFEs. Interestingly, the early exploration of self-talk in exercise made no mention of unintentional or

spontaneous self-talk in regular exercisers (Gammage et al., 2001). Subsequent research supported the presence of spontaneous self-talk in inactive individuals and those contemplating exercise, suggesting a link between this type of self-talk and unfavourable exercise behaviour (O'Brien Cousins, 2003; O'Brien Cousins & Gillis, 2005). As put forward by O'Brien Cousins and Gillis, self-talk may be an ineffective exercise facilitation tool for those who allow it to rule them subconsciously. Accordingly, the frequent use of spontaneous self-talk by teen girls' may contribute to explaining their declining physical activity levels.

Motivational self-talk was used most frequently by HFEs in the present study, replicating findings by Gammage and colleagues (2001). Previously, motivational self-talk has been demonstrated to relate positively to self-confidence, task performance, learning achievement and decreased anxiety (Hatzigeorgiadis et al., 2009; Hidayat & Budiman, 2014). Thus, more frequent use of motivational self-talk by HFEs may contribute to their increased participation in exercise. As demotivational self-talk describes statements used to talk ones' self out of exercising, it would likely hinder exercise participation. Results indicated equal frequencies of demotivational self-talk employed by both groups in the present study; future research is warranted to help better understand the role of demotivational self-talk in exercise.

The infrequent use of instructional self-talk in the present study could be explained by the method of classification used, as statements like "keep going" were classified as motivational. However, the overall focus of teen girls self-talk was not on the process of exercising itself, which is likely why they did not often report using instructions in their self-talk.

In light of findings from the literature and the present study, it appears that links exist between motivational self-talk and favourable behaviour, and spontaneous self-talk and unfavourable behaviour. Thus, although future research is warranted, encouraging teen girls (and perhaps other demographics) to use motivational self-talk when contemplating, beginning or maintaining exercise habits is recommended.

Valence. In the sport and exercise literature, negative self-talk has been considered to be a detriment to physical activity performance and participation (Hardy, 2009; O'Brien Cousins, 2003; Van Raalte et al., 1995). Based on findings to date, and the present study revealing the majority of LFEs' self-talk to be negative, it is probable that frequent use of negative self-talk is linked to unfavourable exercise behaviour. In contrast, positive self-talk has been demonstrated to be facilitative in sport (Tod et al., 2011) and used much more than

negative self-talk by regular exercisers (Gammage et al., 2001). Although HFEs' self-talk was also frequently negative in the current study, positive self-talk was reported equally often. O'Brien Cousin's (2003) finding that in order to participant in exercise positive self-talk was not needed in excess, but in balance to negative self-talk, seems to be supported by the present results.

Although in contradiction to Gammage and colleagues (2001) who found regular exercisers' self-talk to be mostly neutral, the limited use of neutral self-talk by both groups in the present study is supported by Sellars (1997), who described self-talk to be predominantly positive or negative, rarely neutral. This inconsistency is likely a result of different methods of self-talk classification. As previously mentioned, Gammage and colleagues (2001) acknowledged that researchers may have interpreted statements differently from the exercisers, resulting in inaccurate classifications. In contrast, the present study asked participants to give examples of positive and negative self-talk, allowing researchers to classify the remainder of each participant's statements using their own interpretation of their self-talk as a guide.

Negative and positive self-talk seem to have opposing influences on exercise behaviour. Identifying the relationship between self-talk valence and exercise participation is a possible avenue for future researchers to understand how negative and positive self-talk interact, and in what proportion they are ideal for facilitating exercise behaviour.

Limitations and Future Directions

Although these findings significantly contribute to the exercise self-talk literature, they should not be considered without acknowledging this study's limitations: the sample, self-presentational concerns and honesty, recall accuracy, the use of frequency counts as a measurement of self-talk importance.

Firstly, students were recruited from one school; thus, the sample may lack diversity resulting in an inaccurate representation of this demographic as a whole. It is recommended that future studies attempt to look at the self-talk of teen's from various schools with different ethic and socioeconomic backgrounds. It should be noted that the findings of the present study may not be applicable to teen girls as a population due to convenience sampling and the qualitative nature of the study.

Second, participants' elevated self-presentational concerns may indicate increased tendencies for social desirability bias, causing them to respond in manner that they believed would be viewed favourably by others (as opposed to sharing their thoughts fully and honestly;

Crowne & Marlowe, 1960). The Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960) or the Balanced Inventory of Desriable Responding (Paulhus, 1991) are both measures that could be used in subsequent research to allow for the detection and possible exclusion of participants who demonstrate dishonest response tendencies. Future research may also benefit from exploring different data collection methods like online questionnaires. Research indicates that the anonymity of the internet results in a more accurate account of one's personal thoughts and 'true self' (Bargh, McKenna, & Fitzsimons, 2002).

A third limitation, recall bias (a systematic error often present in retrospective research), describes the potential tendency for participants to report experiences from the past inaccurately or incompletely (Last & International Epidemiological Association, 2001). Thus, as participants were asked to recall past experiences (instances in which they used exercise related self-talk), the definitiveness of their responses may have been insufficient. In attempt to overcome this bias, future research could allow for data collection to occur during or immediately after an exercise session. For example, researchers could inquire about self-talk use during a physical education class by requesting participants to fill out questionnaires partway through with potential for follow up (by means of interviews) after the class has commenced.

Lastly, it should be acknowledged that the use of frequency counts may not give the most accurate representation of participants self-talk, as frequency does not necessarily indicate importance. Individual interviews or questionnaires may allow for more accurate insight; as without the dynamic conversation of a group, researchers may have more control over response topics and details.

Conclusion

Self-talk provides a picture of the complex thoughts that teen girls have in regards to exercise. The present study revealed that the self-talk of teen girls focuses on constructs, and alludes to attitudes, that have previously been found to influence exercise behaviour. In comparison to findings regarding regular exercisers, who tend to focus more on the process of exercising itself, teen girls appear to focus more on motives, self-presentational concerns, attitudes, and beliefs. Some of these focuses (i.e., appearance) have been previously demonstrated to be associated with extrinsic forms of motivation and a lack of adherence to behaviours (like exercise). Future research should aim to validate these connections by

evaluating the accuracy and extent to which these thoughts are being illustrated through self-talk.

The present study provides preliminary support that exercise frequency (less than twice a week versus three times or more) may relate to the content, context, and characteristics of teen girls' self-talk. Due to the nature of the present study, definitive differences cannot be determined, however, observations of potential variations between groups are noted. The self-talk of HFEs appeared to focus on self-presentational concerns less than their LFEs peers', while demonstrating stronger and more consistent levels of self-efficacy and beliefs in outcome expectancy (positive correlates of exercise behaviour). As well, in comparison to their non-exercising peers who used spontaneous and negative self-talk most frequently, HFEs seemed to be more likely to use motivational and positive statements. Finally, HFEs' self-talk may be associated with favourable behaviour and used during exercise more than LFEs, whose self-talk appeared to be more frequently associated with unfavourable behaviours and used more outside of exercise settings.

The varying trends in the self-talk of HFEs and LFEs may contribute to supporting the presence of an interactive relationship between self-talk and exercise behaviour. If future research can identify and validate a relationship between self-talk and exercise behaviour in teen girls and other demographics, the possibilities for self-talk interventions to combat the widespread trend of inactivity are numerous.

Based on the paucity of evidence available at this time, it is recommended that, in order to facilitate exercise behaviour and adherence, teen girls should be encouraged to: use self-talk that is positive, motivational, and reinforces facilitative attitudes (i.e. efficacious beliefs); and avoid or counter self-talk that is negative, spontaneous, demotivational, and reinforces debilitative attitudes (i.e. inefficacious beliefs). Future research is recommended to replicate and validate links between self-talk attributes and exercise motivation and behaviour.

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Appendix A

Table 1

Demographics and Grouping Factor (PAQ-A)

Group	Participant*	Age	Item 7	Exercise Q
LFEs	Lydia**	15	2	5
	Maria**	14	2	5
	Ava	14	2	5
	Isabella	15	2	6
	Mia	14	2	2
	Zoe	15	2	2
	Lily	14	1	3
	Aaliyah	14	1	2
	Katrina	17	1	4
	Evelyn	18	1	3
	Olivia**	16	2	6
	Rebecca**	17	2	4
	Hannah	17	1	4
	Hailey	17	2	3
	Nadia**	18	2	2
HFEs	Leah**	14	3	5
	Nora	14	3	6
	Brooklyn	14	5	7
	Anna	15	3	6
	Sarah	14	3	3
	Brianna**	14	4	7
	Liz	15	3	7
	Annabelle	16	4	6
	Maya	17	5	4
	Victoria	17	5	6
	Sophie**	17	5	3
	Claire	17	3	5
	Gabriella	17	4	6

Group	Age (M)	Item 7 (Mdn)	Exercise Q (Mdn)
LFEs	15.67	2	4
HFEs	15.46	4	6

Notes. Age did not differ significantly between groups [t(26)=0.38, p>0.5, MD=0.21].

**Pseudo names were used.*

***Quotes included in results section*

Table 2

Codings by Code

Sub-Category	Code	LFEs	HFEs	Overall
Focus	Outcome	48	40	88
	Appearance	44	24	68
	Comparison to Others	32	21	53
	Concern for Audience	21	9	30
	Task Instruction	11	17	28
	State	16	11	27
	Time Management	18	7	25
	Excuse	14	8	22
	Food	15	7	22
	Exercise Remaining	7	13	20
	Social Media	14	6	20
	Ability	6	13	19
	Past Experience	0	10	10
Attitude	Disinclined	38	30	68
	Obligated	22	26	48
	Inclined	6	12	18
	Inefficacious	27	24	51
	Efficacious	13	28	41
	Absent	14	1	15
	Present	13	12	25
Exercise Behaviour	Favourable	38	102	140
	Unfavourable	87	20	107
Time	During	54	76	130
	Other	77	32	109
	Before	21	34	55
	After	4	4	8
Person	First	120	109	229
	Non-First	37	41	78
Valence	Negative	94	72	166
	Positive	68	70	138
	Neutral	20	20	40
Purpose	Spontaneous	103	72	175
	Motivational	48	77	125
	Demotivational	20	18	38
	Instructional	4	0	4

Notes. Cells represent the number of codings (code applications) for each code.

Table 3

Codings by Participant and Group

	Participant*	Total # of Codings
LFEs	Maria	179
	Zoe	96
	Lily	67
	Aaliyah	86
	Mia	64
	Lydia	81
	Ava	41
	Isabella	101
	Katrina	218
	Rebecca	133
	Hailey	56
	Nadia	60
	Hannah	82
	Evelyn	39
	Olivia	70
HFEs	Leah	120
	Nora	63
	Brooklyn	48
	Anna	86
	Sarah	36
	Brianna	213
	Liz	130
	Annabelle	149
	Maya	72
	Victoria	69
	Sophie	100
	Claire	110
	Gabriella	35

	Total	Mean	SD
LFEs	1373	91.53	50.07
HFEs	1231	94.69	50.45

Notes. The average number of codings per participant did not differ significantly between groups [t(26)=0.166, p>0.05, MD=3.16].
**Pseudo names were used.*

Table 4

Codings for Person-Exercise Behaviour Code Pairs

Behaviour	Person	LFEs	HFEs	% of Self-Talk
Favourable	First	25	69	66%
	Non-First	15	34	34%
Unfavourable	First	76	17	89%
	Non-First	11	1	11%

Table 5

Codings for Outcome-Focus Code Pairs

Focus	LFEs	HFEs	% of Self-Talk
Appearance	22	17	37%
Comparison to Others	14	5	18%
Food	6	6	11%
Ability	5	6	10%
Concern for Audience	6	3	9%
Being Done	1	3	4%
Comparison to Self	3	1	4%
Health	0	3	3%
Fitness	0	3	3%
Exercise Remaining	0	1	1%

Table 6

*Content—Focus Codes**

Code	Description	Example	LFEs	HFEs
State	Includes statements referring to physiological, mental, emotional state (i.e. affect).	*"I'm tired and I don't want to do it anymore"*	16	11
Time Management	Self-talk about lack of time or competing priorities.	*"I have too much homework, I don't have time [to exercise]"*	18	7
Excuse	Perceived by the participant as an excuse to avoid exercising.	*"It's the weekend, I can start again on Monday"*	14	8
Food	Self-talk triggered by or referring to eating and the energy trade off of caloric consumption and expenditure.	*"Why am I eating cake when it takes this much to burn it off?"*	15	7
Exercise Remaining	Counting, acknowledging or planning, how much exercise is remaining.	*"five more minutes"*	7	13
Social Media	Referencing or resulting from exposure to social media.	*I'll just compare myself and basically it demotivates me because I'll be like, "Well I don't look like that… and I don't think I could"*	14	6
Ability	Self-talk referring to their ability to perform a task or complete an action.	*"If I do this everyday I could become faster"*	6	13
Past Experience	When participants bring up or refer to previous achievements or positive experiences in their self-talk.	*"you did it before you can do it again"*	0	10

*Notes. *Includes codes not included in analysis in order of overall frequency.*

Curriculum Vitae

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